

CLAIMS:

1. A yielding rock bolt arranged to be inserted into a hole in a rock surface, characterised by comprising a shaft formed of a solid metal bar, the shaft having a first end and a second end, the shaft having a relatively wide portion adjacent the first end thereof and a relatively narrow portion adjacent the wide portion, an anchor member having a longitudinal bore mounted about the shaft at the relatively narrow portion and adjacent the wide portion, the longitudinal bore having at least a portion of lesser dimension than the relatively wide portion.
2. A yielding rock bolt according to claim 1, characterised in that the narrow portion of the shaft is a relatively short section of the shaft adjacent the wide portion.
3. A yielding rock bolt according to claim 1, characterised in that the narrow portion of the shaft extends from the wide portion to the second end of the shaft.
4. A yielding rock bolt according to any one of the preceding claims, characterised in that a debonding sheath is mounted about the shaft in regions thereof apart from the anchor member.
5. A yielding rock bolt according to claim 4, characterised in that the debonding sheath extends along the full length of the shaft apart from the region at which the anchor member is disposed.
6. A yielding rock bolt according to any one of the preceding claims, characterised in that the anchor member is formed of heat treated steel.
7. A yielding rock bolt according to claim 6, characterised in that the anchor member has a relatively wide portion adjacent the wide portion of the shaft and a portion tapering inwardly towards the second end of the shaft.

8. A yielding rock bolt according to claim 6 or 7, characterised in that the longitudinal bore of the anchor member is treated to prevent sticking between the anchor member and the shaft.
9. A yielding rock bolt according to claim 8, characterised in that the anchor member is nitrided in the longitudinal bore to prevent sticking between the anchor member and the shaft
10. A yielding rock bolt according to any one of the preceding claims, characterised in that a rock engaging plate is mounted about the shaft adjacent the second end thereof.
11. A yielding rock bolt according to any one of the preceding claims, characterised in that a stop portion is mounted about the shaft adjacent the second end thereof.
12. A yielding rock bolt according to claim 11, characterised in that the stop portion is a welding ring of relatively hard material.
13. A yielding rock bolt according to any one of the preceding claims, characterised in that a mixing paddle is attached to the first end of the shaft.
14. A yielding rock bolt according to claim 2, characterised in that the anchor member initially has a substantially uniform longitudinal bore of sufficient dimension to fit over the shaft, and the relatively narrow portion of the shaft is formed by placing the anchor member in a swage press so as to deform the anchor member to form at least a portion of the longitudinal bore of reduced dimension and a corresponding portion of the shaft of similarly reduced dimension.
15. A method of securing a rock face characterised by drilling a hole therein, inserting a yielding rock bolt according to any one of the preceding claims into the hole with the first end foremost, filling the hole with bonding material such that if an adjacent portion of the rock face begins to breakaway the wide

portion of the shaft is extruded through the anchor member so that the rock bolt yields as the rock face moves.